

# *Tree Planters' Notes*

U.S. Department of Agriculture—Forest Service



Volume 49, No. 2



## **Tree Planting in the United States—1998**

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Volume 49, Number 2

## STATE AND PRIVATE FORESTRY REPORT

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## Tree Planters' Notes

Dedicated to technology transfer and publication of research information relating to nursery production and outplanting of trees, shrubs, and native plants for reforestation, restoration, and conservation.

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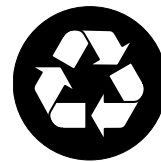
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May 2000

# Tree Planting in the United States—1998

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*This annual report summarizes tree planting, timber stand improvement, and nursery production activities across all ownerships of forest land in the United States. It includes State-by-State and ownership breakdowns, regional totals, as well as analysis of trends in the data. It does not include tree planting in urban and community environments. As far as we know, it is the most complete compilation of such data in the country. Because some of the data are estimated, caution must be used in drawing inferences. Tree Planters' Notes 49 (2) 23-36; 1999. Robert Moulton, USDA Forest Service, Forestry Sciences Laboratory, P.O. Box 12254, Research Triangle Park, NC 27709; 919-549-4032; >>rmoulton@fs.fed.us<<. For nursery information, contact George Hernandez, USDA Forest Service, 1720 Peach Tree Road NW, Atlanta, GA 30367; 404-347-3554; >>ghernandez@fs.fed.us<<.*

## Tree Planting

### Overview

Tree planting on all ownerships in the United States in fiscal year (FY) 1998 totaled 2,624,681 acres. This is a minor decrease of 11,421 acres (-0.4%) from total tree planting in last year (FY 1997), a pause in planting activity following the 10% increase posted in 1997, as compared with 1996.

As shown in the accompanying table (page 26), tree planting in the United States has been on a rather steady upward track over the long term, rising from about 140 thousand acres in 1930 to the current annual level of 2.6 million acres. Three major peak periods of tree planting activity have occurred over the years, all of which were associated with major Federal programs.

The Civilian Conservation Corps (CCC) planted 2.3 million acres of public and private lands to trees from the mid-1930's to the mid-1940's; the Soil Bank Program planted 2.2 million acres of private crop lands to trees from 1956 through 1961; and the Conservation Reserve

### 1998 SUMMARY

- ▶ Trees were planted on 2,624,681 acres.
- ▶ Timber stand improvement was completed on 2,398,543 acres.
- ▶ Nursery production totaled 1,642,089,000 trees.

Program (CRP) has planted trees on 2.8 million acres of highly erodible crop lands, mostly during the late 1980's.

Actually, not one of these major programs was created to plant trees nor to provide other natural resource benefits, per se, but rather to address greater societal needs. The CCC was a Great Depression program that provided employment to thousands of unemployed young men, and both the Soil Bank and CRP were prompted by economic crises in agriculture and the need to take surplus crop land out of production to enhance farmers' incomes and to reduce Federal Government agricultural program costs.

Currently, ever increasing concerns about global climate change could prompt yet another major reforestation program. Because trees and forests play a vital role in regulating the Earth's carbon cycle, Accelerated Tree Planting on Nonindustrial Private Lands was one of the mitigation strategies included in the President's 1993 Climate Change Action Plan, and electric utility companies and others have already launched significant new climate change forestry initiatives, including domestic and overseas tree planting projects.

Several observations can be made regarding 1998 tree planting accomplishments:

- ▶ This year's planting of over 2.6 million acres is the second largest acreage planted to trees in any year since 1990.

*Summary of tree planting in the United States,  
1930–1998*

Fiscal year	Acres
<b>5-Year Interval</b>	
1930	138,970
1935	292,033
1940	519,051
1945	138,944
1950	497,507
1955	812,588
1960	2,137,460
1965	1,325,063
1970	1,599,819
1975	1,930,468
1980	2,266,956
1985	2,695,423
<b>1-Year Interval</b>	
1986	2,753,176
1987	3,033,159
1988	3,394,478
1989	3,021,948
1990	2,862,207
1991	2,558,025
1992	2,544,862
1993	2,419,691
1994	2,477,479
1995	2,421,861
1996	2,406,700
1997	2,636,102
<b>1998</b>	<b>2,624,681</b>

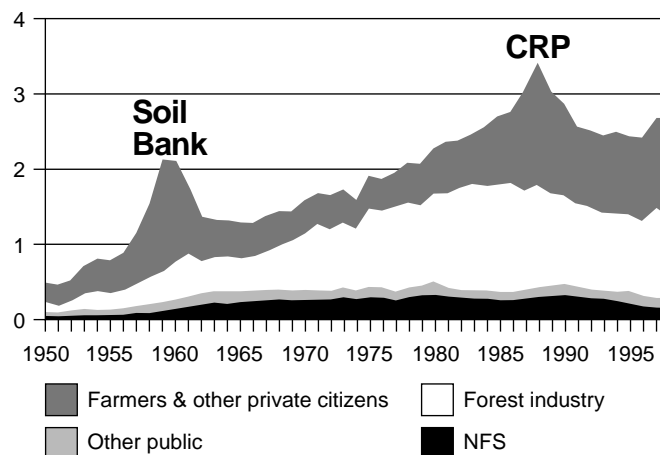
- ▶ Private landowners did 90% of all tree planting.
- ▶ Nonindustrial private forest (NIPF) landowners planted more acres than any other group of owners (48% of the U.S. total) and had their best year since 1989.
- ▶ Forest industry planting declined moderately but remained large at 42% of the U.S. total.
- ▶ Tree planting on the national forests (6% of the U.S. total) continued its downward trend, falling to its lowest level since 1960.
- ▶ More trees are planted each year on State forests than on any other category of State and local government lands.
- ▶ The Southern States planted the largest acreage of trees—79% of U.S. total—of any region in the country.
- ▶ Georgia was, once again, the top tree planting State.

### Tree Planting by Ownership Group

Private landowners planted 2,353,290 acres of trees in FY 1998, 90% of all tree planting in the United States for the year. These overall figures are similar to those for last year. However, in 1998, nonindustrial private forest land owners increased their rate of planting, while planting declined moderately on forest industry ownerships.

Total tree planting on public ownership was also essentially unchanged from last year, but a notable decrease was reported this year for planting on State and local government ownerships.

### Tree Planting in the United States by Ownership Group (Millions of Acres)



**Nonindustrial Private Forest Landowners.** Private landowners with the exception of companies in the forest products industry planted 1,257,973 acres, a 14% increase over last year. This is the highest acreage planted to trees by these owners since 1989, and represents 48% of U.S. total planting this year, up from 42% last year.

In FY 1998, Federal cost share assistance programs of the U.S. Department of Agriculture assisted NIPF landowners with the planting of 168,000 acres of trees. An additional 211,000 acres were planted under the CRP and the Wetlands Reserve Program (WRP).

The boost provided by the Reserve Programs contributed to the increase in planting on NIPF ownerships this year. In contrast, Federal funding for cost-share programs has declined sharply in recent years. In the early 1990's, the Agricultural Conservation Program (ACP) planted about 125,000 acres per year, but this program was eliminated by the 1996 Farm Bill. Annual

funding has been reduced by 50% for Forestry Incentives Program (FIP), and tree planting under this program has declined from 175,000 acres per year to the current level of 82,000 acres. Further, Congress provided no funding for the Stewardship Incentive Program (SIP) in fiscal year 1999.

**Forest Industry.** Companies in the forest products industry reported the planting of 1,095,317 acres of trees in FY 1998 (42% of the U.S. total), a decline of 93,045 acres (-8%) from their 1997 accomplishments. This decrease is largely attributable to tree planting in Alabama returning to a normal level following record accomplishments in that State last year, as described in more detail in the State and Regional Highlights of this report.

**National Forests.** Tree planting on National Forest System (NFS) lands administered by the USDA Forest Service totaled 146,887 acres (6% of U.S. total) in FY 1998. The Forest Service leads all other public agencies in annual tree planting accomplishment. However, this year's planting declined by 8% from last year, is less than one-half of acreage planted each year in the late 1980's and early 1990's, and is at its lowest level since 1960.

**Other Public Lands.** Department of the Interior agencies reported 27,996 acres of tree planting in FY 1998, and all other Federal agencies (excluding Agriculture and Interior) planted 13,686 acres.

State and local governments reported the planting of 82,822 acres of trees in fiscal year 1998 (3% of U.S. total), 19% less than were planted in 1997. State forests led this group with 63% of all planting on State and local government lands.

#### *USDA Program Tree Planting in FY 1998 (Thousand Acres)*

FIP	82
SIP	70
Wildlife Habitat Improvement Program (WHIP)	16
<i>Subtotal Cost-Share Programs</i>	(168)
WRP	45
CRP	166
<i>Subtotal Reserve Programs<sup>1</sup></i>	(211)
<b>TOTAL</b>	<b>379</b>

<sup>1</sup>The Reserve Programs provide annual rental payments in addition to technical assistance and practice cost sharing.

## State and Regional Highlights

**The Top States.** Eleven States each planted more than 100,000 acres in FY 1998.

Collectively, these States, nine of which are in the South and two in the Pacific Northwest, planted 2.2 million acres, 84% of the U.S. total.

Georgia resumed its traditional place as the leading tree planting State, after being displaced last year by Alabama due to a major effort by forest industry in that State to replant company lands damaged by Hurricane Opal in October 1995. This year, Alabama ranked third, and Mississippi second; both States planted well over 300,000 acres.

Other notable changes from last year include Texas in 5th place—up from 11th last year; the addition of Virginia to, and the omission of South Carolina from, the Top States list.

#### *States that planted more than 100,000 acres of trees in FY 1998*

Georgia	416,000
Mississippi	371,000
Alabama	310,000
Florida	189,000
Texas	163,000
Oregon	158,000
Louisiana	156,000
Washington	130,000
Arkansas	114,000
North Carolina	106,000
Virginia	101,000

**Regional Notes.** The 13 States in the South (see Definitions) planted 2,065,779 acres of trees in fiscal year 1998, 79% of the U.S. total. The West ranked next with 446,973 acres (17% of the U.S. total). And, the States in the North reported the planting of 111,929 acres (4% of the U.S. total).

## Direct Seeding

The use of seeds to establish trees in the field (planting by direct seeding) was reported on 12,369 acres.

## Appendix Tables

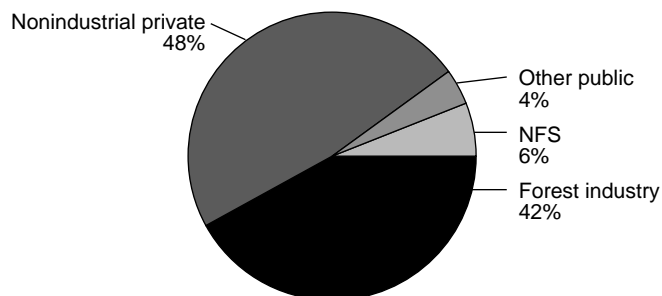
Tree planting acreage for all States by ownership categories are presented in appendix tables 1 through 5.

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**Total planting and seeding by ownership category in FY 1998:**

	Acres	Percent of all planting
<b>Federal Government</b>		
National Forests	146,887	5.6
Department of the Interior	27,996	1.1
Other Federal Agencies	13,686	0.5
<b>Total</b>	<u>188,569</u>	<u>7.2</u>
<b>State and Local Government</b>		
State Forests	51,880	2.0
Other State Lands	11,541	0.4
Local Government	19,401	0.7
<b>Total</b>	<u>82,822</u>	<u>3.1</u>
<b>Private</b>		
Forest Industry	1,095,317	41.7
Other Industry <sup>1</sup>	(21,748)	(0.8)
Nonindustrial Private	1,257,973	47.9
<b>Total</b>	<u>2,353,290</u>	<u>89.7</u>
<b>Grand total</b>	<b>2,624,681</b>	<b>100.0</b>

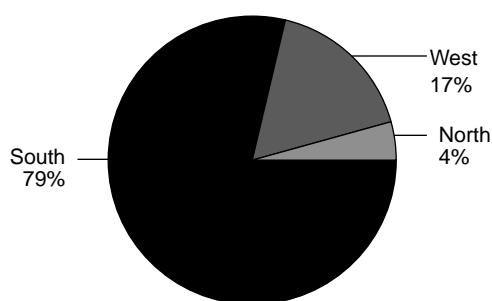
<sup>1</sup>Other Industry: Industries without wood processing facilities are included in entry for Non-industrial Private Owners.




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**Total planting and seeding by region in FY 1998:**

	Acres	Percent of all planting
North	111,929	4.3
South	2,065,779	78.7
West	446,973	17.0
<b>Total</b>	<u>2,624,681</u>	<u>100.0</u>



## Timber Stand Improvement

### Timber Stand Improvement by Ownership Group

Timber stand improvement (TSI) was reported for 2,398,543 acres in FY 1998. Last year only 1,417,057 acres were reported, and we cautioned that this simply might be a function of nonreporting or the under reporting of actual accomplishments, associated largely with changes that were occurring in our reporting process. In any event, this year's total of almost 2.4 million acres appears to be in line with the 2.6 million acres reported for FY 1996 and with TSI accomplishments in prior years.

Industrial owners clearly stand out in TSI work; they reported 1,632,710 acres, 68% of the U.S. total. The national forests rank second but did far less work, only 12% of the total. And while NIPF owners were first in tree planting, they completed less than 12% of all TSI acres, even though data collected by the USDA Forest Service indicates that many of these lands would benefit from TSI activities.

### State and Regional Highlights

Six States reported completing 50,000 or more acres of TSI in FY 1998, and, together, these States worked on 2,001,563 acres, 85% of the U.S. total.

Oregon worked on 1,405,266 acres, 60% of the U.S. total.

Due to the large amount of activity in Oregon—especially by forest industry and other industrial owners in that State—the West completed 79% of all TSI completed in the United States in 1998. The South was next with 14%, while the North did the remaining 7%.

#### *States with Timber Stand Improvement on 50,000 or More Acres in FY 1998*

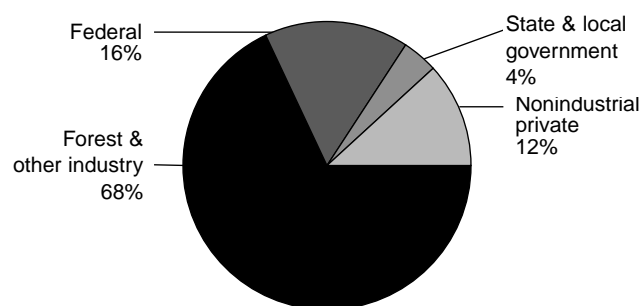
Oregon	1,405,000
Washington	267,000
Arkansas	118,000
California	83,000
Alabama	78,000
Mississippi	50,000

### Appendix Tables

Table 6 in the appendix lists the reported timber stand accomplishments by ownership and State for this year.

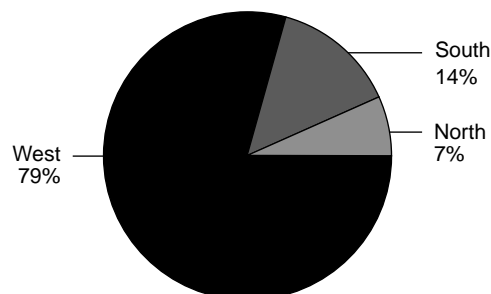
### Timber stand improvement by ownership category in FY 1998:

	Acres	Percent of total
National Forest	300,202	12.6
Other Federal	86,958	3.6
State & Local Government	96,114	4.0
Nonindustrial Private	282,559	11.8
Forest & Other Industry	1,632,710	68.0
<b>Total</b>	<b>2,398,543</b>	<b>100.0</b>



### Timber stand improvement by region in FY 1998:

	Acres	Percent of total
North	160,469	6.7
South	334,727	14.0
West	1,903,347	79.3
<b>Total</b>	<b>2,398,543</b>	<b>100.0</b>





## Nursery Production

A total of 1,642,089,000 trees were produced (shipped) by forest tree nurseries in the United States in FY 1998. This is an increase of 18 million trees (2%) over the 1,623,978,000 trees reported for FY 1997.

### By Sector

**Forest Industry.** Nurseries owned by forest product companies produced 772,630,000 million trees in FY 1998, 47% of all production and 79 million less than in 1997.

**Other Industry.** Private nurseries not owned by forest industry produced 315,320,000 million trees in 1998, a decrease of 50 million trees from last year.

**State Nurseries.** State nurseries produced 480 million trees (29% of U.S. total) in FY 1998, as compared with 348 million in FY 1997.

**Other Public Nurseries.** Federal nurseries produced 62 million trees in FY 1998, 4% of the U.S. total, and 9 million more trees than they grew in 1997.

Only 11 million trees were reported as being produced by nurseries operated by local governments in FY 1998.

### State and Regional Highlights

**The Top States.** Twelve States each produced 55 million or more trees in their nurseries in FY 1998. Georgia topped the list again in 1998 with 357 million trees, followed by Florida with 154 million. Alabama, Arkansas, Mississippi, and Texas each produced over 100 million trees.

Together, these six States produced 65% of the nursery trees in the United States.

#### *States with nursery production of 55 million or more trees in FY 1998*

Georgia	357 million
Florida	154 million
Alabama	127 million
Arkansas	125 million
Texas	106 million
Mississippi	101 million
South Carolina	97 million
North Carolina	85 million
Oregon	67 million
Louisiana	66 million
Washington	63 million
Virginia	57 million

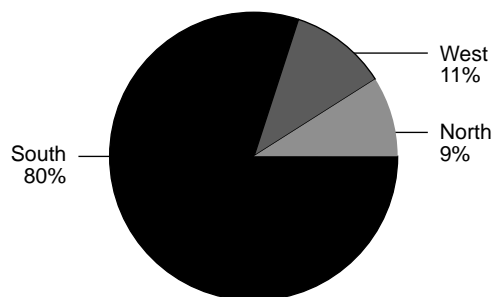
**Regional Notes.** The South produced almost 1.3 billion forest trees (80% of U.S. total) and 30 million more than last year. Nursery output was down in the West and totaled 186 million (11% of U.S. total). Nursery production in the North was reported at only 148 million (9% of U.S. total).

### Appendix Tables

Nursery production, in thousands of trees, by ownership category is presented in appendix table 7.

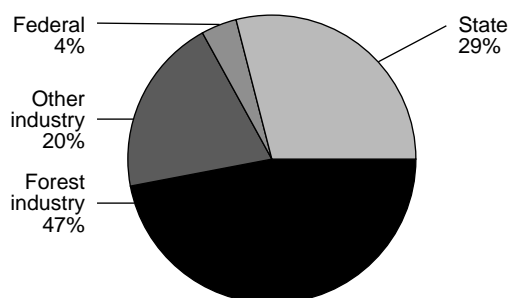
#### Nursery production by region in FY 1998:

Region	Million seedlings	Percent of total
North	148	9
South	1,307	80
West	186	11
<b>Total</b>	<b>1,624</b>	<b>100</b>



### Nursery production of tree planting stock by public, industrial, and other private nurseries in FY 1998:

Nurseries	Million seedlings	Percent of total
Federal	62	4
State	480	29
Forest Industry	773	47
Other Industry	326	20
<b>Total</b>	<b>1,641</b>	<b>100</b>



### Acknowledgments

This report reflects the input of many people, and we gratefully acknowledge their individual contributions. In addition to the assistance of personnel from USDA Forest Service field offices in verifying the accuracy of submissions, we appreciate the efforts of personnel in the State forestry agencies in obtaining data from companies in the forest products and other industries, all State and local agencies, and individual private landowners. Specifically, we recognize the contributions of the following: Ron Overton, USDA Forest Service State and Private Forestry, Northeastern Area, provided the nursery data; Frank Burch, USDA Forest Service Forest Management Staff, Washington Office, provided data for all NFS lands; Mark Buckbee, Bureau of Land Management, and Bill Downes, Bureau of Indian Affairs, furnished Department of Interior data; Scott English, U.S. Army Environmental Center, and Denise Y. White, U.S. Army Corps of Engineers, provided Department of Army entries; and Jack A. Muncy reported for the Tennessee Valley Authority.

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## Appendix

### Definitions

The following terms and/or assumptions used in the text are defined in this section:

**North**—Includes Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin.

**South**—Includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, Puerto Rico, South Carolina, Tennessee, Texas, and Virginia.

**West**—Includes Alaska, Arizona, California, Colorado, Hawaii, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, Wyoming, and the territories of American Samoa, Commonwealth of the Northern Mariana Islands (CNMI), Federated States of Micronesia (FSM), Guam, Marshall Islands, and the Republic of Palau.

**Other Federal**—Lands administered by the Department of Energy, the Tennessee Valley Authority, the Department of the Interior, and the U. S. Army Corps of Engineers (table 1).

**Other State**—State owned lands other than those designated as State forests. Examples include State wildlife management areas, recreation areas, State school lands, and lands owned in connection with State correctional facilities or other institutions (table 2).

**Local government**—Lands (table 2) or nurseries (table 7) owned by counties, municipalities, and other units of local government.

**Nonindustrial private forest**—Land owned by private owners, farmers, and Indian Nations, but excluding industrial owners (tables 3, 4, and 6).

**Forest industry**—Private lands owned by companies or individuals operating wood using plants (tables 3, 4, and 6).

**Other industry**—Private lands owned by companies other than those in the forest industry. Major examples are lands owned by mining, railroad, and utility companies; insurance companies, pension funds, and investment companies (table 3, 4, and 6), or private growers outside of the forest industry (table 7).

**Non-Federal-public**—Lands owned by State and local governments (table 4).

**Direct Seeding**—Sowing tree seeds (instead of planting seedlings) to establish stands of trees in the field.

**Timber Stand Improvement**—Practices to enhance timber production in existing stands of trees, such as control of unwanted, competing vegetation; thinning to control spacing; and pruning.

**Fiscal Year**—A 12-month period established for accounting and reporting purposes, which for the USDA Forest Service is from October 1 through September 30.

Note: 1 acre = .405 hectares; 1 hectare = 2.47 acres.

**Table 1—Tree planting, including seeding, on Federal land (in FY 98)**

	NFS	Department of the Interior	Other Federal	Total
	Acres			
Alabama	1,161	0	1,329	2,490
Alaska	354	0	0	354
Arizona	1,444	228	0	1,672
Arkansas	3,536	0	2,013	5,549
California	27,900	336	48	28,284
Colorado	386	273	3	662
Connecticut	0	0	0	0
Delaware	0	0	0	0
Florida	3,727	0	3,924	7,651
Georgia	1,037	0	1,370	2,407
Hawaii	0	0	0	0
Idaho	19,596	368	0	19,964
Illinois	531	0	32	563
Indiana	0	0	18	18
Iowa	0	0	4	4
Kansas	0	0	8	8
Kentucky	409	0	22	431
Louisiana	919	0	210	1,129
Maine	0	8	0	8
Maryland	0	0	8	8
Massachusetts	0	0	2	2
Michigan	3,017	25	0	3,042
Minnesota	2,292	719	6	3,017
Mississippi	5,426	263	709	6,398
Missouri	256	0	132	388
Montana	10,669	1,318	5	11,992
Nebraska	0	200	0	200
Nevada	195	340	0	535
New Hampshire	0	0	3	3
New Jersey	0	0	6	6
New Mexico	1,002	1,656	0	2,658
New York	0	0	0	0
North Carolina	563	0	1,298	1,861
North Dakota	0	45	186	231
Ohio	80	0	17	97
Oklahoma	0	0	63	63
Oregon	43,153	13,205	0	56,358
Pennsylvania	189	0	7	196
Rhode Island	0	0	0	0
South Carolina	414	0	776	1,190
South Dakota	0	90	139	229
Tennessee	273	0	404	677
Texas	504	0	510	1,014
Utah	1,003	100	0	1,103
Vermont	185	0	0	185
Virginia	254	0	118	372
Washington	14,043	7,991	224	22,258
West Virginia	85	0	2	87
Wisconsin	894	788	10	1,692
Wyoming	1,390	43	80	1,513
American Samoa	0	0	0	0
CNMI	0	0	0	0
FSM	0	0	0	0
Guam	0	0	0	0
Marshall Islands	0	0	0	0
Palau	0	0	0	0
Puerto Rico	0	0	0	0
<b>Grand total</b>	<b>146,887</b>	<b>27,996</b>	<b>13,686</b>	<b>188,569</b>

**Table 2—Tree planting, including seeding, on State and local government lands (in FY 98)**

	State Forest Land	Other State Land	Local Government	Total
Acres				
Alabama	100	350	0	450
Alaska	483	2,300	0	2,783
Arizona	0	5	0	5
Arkansas	0	889	0	889
California	4	0	0	4
Colorado	40	35	210	285
Connecticut	5	13	0	18
Delaware	0	0	0	0
Florida	4,308	0	0	4,308
Georgia	3,838	0	0	3,838
Hawaii	42	0	0	42
Idaho	3,417	0	4	3,421
Illinois	0	0	0	0
Indiana	50	0	0	50
Iowa	94	106	63	263
Kansas	0	56	0	56
Kentucky	2	105	95	202
Louisiana	2,559	0	0	2,559
Maine	0	0	0	0
Maryland	75	175	180	430
Massachusetts	0	0	0	0
Michigan	7,700	0	0	7,700
Minnesota	7,075	0	1,961	9,036
Mississippi	0	5,890	14,487	20,377
Missouri	0	0	0	0
Montana	622	0	0	622
Nebraska	0	0	0	0
Nevada	0	34	1	35
New Hampshire	0	0	0	0
New Jersey	25	1	13	39
New Mexico	0	40	0	40
New York	52	1	5	58
North Carolina	132	302	850	1,284
North Dakota	18	0	0	18
Ohio	31	0	0	31
Oklahoma	0	85	10	95
Oregon	2,714	0	552	3,266
Pennsylvania	0	0	0	0
Rhode Island	0	0	8	8
South Carolina	835	208	903	1,946
South Dakota	0	73	0	73
Tennessee	169	857	0	1,026
Texas	352	0	0	352
Utah	0	0	0	0
Vermont	10	0	0	10
Virginia	123	14	0	137
Washington	17,000	0	0	17,000
West Virginia	0	0	0	0
Wisconsin	0	0	0	0
Wyoming	0	0	0	0
American Samoa	0	0	2	2
CNMI	0	0	0	0
FSM	5	0	0	5
Guam	0	0	55	55
Marshall Islands	0	0	0	0
Palau	0	0	2	2
Puerto Rico	0	2	0	2
<b>Grand total</b>	<b>51,880</b>	<b>11,541</b>	<b>19,401</b>	<b>82,822</b>

**Table 3—Tree planting, including seeding, on private land (in FY 98)**

	Nonindustrial Private	Other Industry (Included in NIPF)	Forest Industry	Total
Acres				
Alabama	162,330	0	144,500	303,830
Alaska	2,397	0	0	2,397
Arizona	42	0	0	42
Arkansas	47,300	(200)	60,000	107,300
California	10,718	(400)	30,000	40,718
Colorado	5,636	(30)	0	5,636
Connecticut	127	0	0	127
Delaware	1,123	0	1,123	2,246
Florida	67,422	0	109,516	176,938
Georgia	259,660	0	150,375	410,035
Hawaii	983	0	0	983
Idaho	1,203	0	10,294	11,497
Illinois	8,406	0	0	8,406
Indiana	1,990	(700)	100	2,090
Iowa	6,632	0	0	6,632
Kansas	1,470	0	1	1,471
Kentucky	5,781	(2,177)	1,855	7,636
Louisiana	27,820	0	124,000	151,820
Maine	927	0	9,924	10,851
Maryland	6,250	0	1,450	7,700
Massachusetts	14	0	0	14
Michigan	0	0	0	0
Minnesota	8,699	0	3,790	12,489
Mississippi	243,188	0	101,469	344,657
Missouri	2,250	0	0	2,250
Montana	418	0	5,866	6,284
Nebraska	4,089	0	0	4,089
Nevada	62	(1)	0	62
New Hampshire	0	0	0	0
New Jersey	219	(114)	0	219
New Mexico	392	0	0	392
New York	254	(5)	0	254
North Carolina	77,485	0	25,197	102,682
North Dakota	2,982	0	0	2,982
Ohio	2,571	0	1,106	3,677
Oklahoma	5,618	(50)	15,366	20,984
Oregon	20,708	(1,663)	77,389	98,097
Pennsylvania	3,774	(621)	0	3,153
Rhode Island	37	0	0	37
South Carolina	63,891	(15,518)	32,175	96,066
South Dakota	4,464	0	0	4,464
Tennessee	9,717	0	0	9,717
Texas	67,260	0	93,991	161,251
Utah	0	0	0	0
Vermont	45	0	0	45
Virginia	71,126	0	29,739	100,865
Washington	24,336	0	66,038	90,374
West Virginia	1,995	(7)	53	2,048
Wisconsin	22,111	0	0	22,111
Wyoming	1,586	0	0	1,586
American Samoa	24	0	0	24
CNMI	0	0	0	0
FSM	37	0	0	37
Guam	20	0	0	20
Marshall Islands	20	0	0	20
Palau	63	0	0	63
Puerto Rico	301	(262)	0	301
<b>Grand total</b>	<b>1,257,973</b>	<b>(21,748)</b>	<b>1,095,317</b>	<b>2,353,290</b>

**Table 4**—Direct seeding by ownership category; included in tables 1, 2, & 3 (in FY 98)

	Federal	State & Local Gov't	Non- industrial Private	Forest & Other Industry	Total
	Acres				
Alabama	0	0	0	0	0
Alaska	0	0	0	0	0
Arizona	0	0	30	0	30
Arkansas	550	0	100	0	650
California	0	0	0	0	0
Colorado	40	0	0	0	40
Connecticut	0	0	0	0	0
Delaware	0	0	0	0	0
Florida	2,909	619	100	0	3,628
Georgia	0	0	466	0	466
Hawaii	0	0	0	0	0
Idaho	0	0	0	10	10
Illinois	0	0	14	0	14
Indiana	0	0	0	0	0
Iowa	0	0	239	0	239
Kansas	0	6	7	0	13
Kentucky	0	0	2	0	2
Louisiana	0	0	0	0	0
Maine	0	0	0	0	0
Maryland	0	0	0	0	0
Massachusetts	0	0	0	0	0
Michigan	751	1,500	0	0	2,251
Minnesota	34	3,315	0	0	3,349
Mississippi	104	10	0	0	114
Missouri	0	0	0	0	0
Montana	0	0	0	0	0
Nebraska	0	0	0	0	0
Nevada	0	0	0	0	0
New Hampshire	0	0	0	0	0
New Jersey	0	1	0	0	1
New Mexico	0	0	0	0	0
New York	0	5	52	0	57
North Carolina	114	0	118	0	232
North Dakota	0	0	342	0	342
Ohio	0	0	0	0	0
Oklahoma	0	0	0	0	0
Oregon	0	0	0	0	0
Pennsylvania	0	0	158	0	158
Rhode Island	0	0	0	0	0
South Carolina	0	0	0	0	0
South Dakota	0	0	0	0	0
Tennessee	0	0	0	0	0
Texas	0	0	0	0	0
Utah	0	0	0	0	0
Vermont	0	0	0	0	0
Virginia	1	0	0	0	1
Washington	0	0	0	0	0
West Virginia	0	0	8	0	8
Wisconsin	0	0	158	0	158
Wyoming	45	0	561	0	606
American Samoa	0	0	0	0	0
CNMI	0	0	0	0	0
FSM	0	0	0	0	0
Guam	0	0	0	0	0
Marshall Islands	0	0	0	0	0
Palau	0	0	0	0	0
Puerto Rico	0	0	0	0	0
<b>Grand total</b>	<b>4,548</b>	<b>5,456</b>	<b>2,355</b>	<b>10</b>	<b>12,369</b>

**Table 5—Tree planting, including seeding, by ownership category (in FY 98)**

	Table 1 (Federal)	Table 2 (Non-Federal Public)	Table 3 (Private)	Total Acres Planted
	Acres			
Alabama	2,490	450	306,830	309,770
Alaska	354	2,783	2,397	5,534
Arizona	1,672	5	42	1,719
Arkansas	5,549	889	107,300	113,738
California	28,284	4	40,718	69,006
Colorado	662	285	5,636	6,583
Connecticut	0	18	127	145
Delaware	0	0	2,246	2,246
Florida	7,651	4,308	176,938	188,897
Georgia	2,407	3,838	410,035	416,280
Hawaii	0	42	983	1,025
Idaho	19,964	3,421	11,497	34,882
Illinois	563	0	8,406	8,969
Indiana	18	50	2,090	2,158
Iowa	4	263	6,632	6,899
Kansas	8	56	1,471	1,535
Kentucky	431	202	7,636	8,269
Louisiana	1,129	2,559	151,820	155,508
Maine	8	0	10,851	10,859
Maryland	8	430	7,700	8,138
Massachusetts	2	0	14	16
Michigan	3,042	7,700	0	10,742
Minnesota	3,017	9,036	12,489	24,452
Mississippi	6,398	20,377	344,657	371,432
Missouri	388	0	2,250	2,638
Montana	11,992	622	6,284	18,898
Nebraska	200	0	4,089	4,289
Nevada	535	35	62	632
New Hampshire	3	0	0	3
New Jersey	6	39	219	264
New Mexico	2,658	40	392	3,090
New York	0	58	254	312
North Carolina	1,861	1,284	102,682	105,827
North Dakota	231	18	2,982	3,231
Ohio	97	31	3,677	3,805
Oklahoma	63	95	20,984	21,142
Oregon	56,358	3,266	98,097	157,721
Pennsylvania	196	0	3,374	3,970
Rhode Island	0	8	37	45
South Carolina	1,190	1,946	96,066	99,202
South Dakota	229	73	4,464	4,766
Tennessee	677	1026	9,717	11,420
Texas	1,014	352	161,251	162,617
Utah	1,103	0	0	1,103
Vermont	185	10	45	240
Virginia	372	137	100,865	101,374
Washington	22,258	17,000	90,374	129,632
West Virginia	87	0	2,048	2,135
Wisconsin	1,692	0	22,111	23,803
Wyoming	1,513	0	1,586	3,099
American Samoa	0	2	24	26
CNMI	0	0	0	0
FSM	0	5	37	42
Guam	0	55	20	75
Marshall Islands	0	0	20	20
Palau	0	2	63	65
Puerto Rico	0	2	301	303
<b>Grand total</b>	<b>188,569</b>	<b>82,822</b>	<b>2,353,290</b>	<b>2,624,681</b>

**Table 6—Timber stand improvement by ownership category (in FY 98)**

	Non- industrial Private	Forest & Other Industry	State & Local Gov't	NFS	Other Federal	Total
Acres						
Alabama	76,647	0	0	2,312	10	78,969
Alaska	2,838	0	315	4,555	124	7,832
Arizona	430	0	2	7,910	4,538	12,880
Arkansas	350	105,559	0	11,603	0	117,512
California	2,144	3,100	12	76,233	1,062	82,551
Colorado	776	27	980	7,112	147	9,042
Connecticut	8,573	0	625	0	0	9,198
Delaware	0	0	0	0	0	0
Florida	1,153	0	772	834	0	2,759
Georgia	7,613	0	0	3,299	0	10,912
Hawaii	1,450	0	0	0	0	1,450
Idaho	2,653	15,046	3,740	22,431	161	44,031
Illinois	12,661	0	0	256	0	12,917
Indiana	9,743	0	1,000	0	0	10,743
Iowa	3,206	0	240	0	0	3,446
Kansas	251	0	0	0	0	251
Kentucky	26,084	866	312	328	0	27,590
Louisiana	4,491	0	1,000	3,989	0	9,480
Maine	4,732	58,225	0	0	374	63,331
Maryland	5,375	3,275	510	0	0	9,160
Massachusetts	20,455	0	0	0	0	20,455
Michigan	0	0	1,000	3,423	78	4,501
Minnesota	3,566	0	0	2,459	842	6,867
Mississippi	26,912	0	19,881	3,129	80	50,002
Missouri	0	0	0	3,206	0	3,206
Montana	1,535	9,000	4,209	13,124	3,929	31,797
Nebraska	177	0	0	0	0	177
Nevada	6	0	48	220	1,668	1,942
New Hampshire	0	0	0	0	0	0
New Jersey	0	0	0	0	0	0
New Mexico	0	0	0	5,995	9,525	15,520
New York	1,646	50	44	22	0	1,762
North Carolina	5,509	3,630	442	3,562	0	13,143
North Dakota	679	0	27	0	0	706
Ohio	4,247	0	737	0	0	4,984
Oklahoma	2,072	7,800	25	38	122	10,057
Oregon	17,089	1,253,123	30,463	71,205	33,386	1,405,266
Pennsylvania	0	0	0	553	0	553
Rhode Island	384	0	0	0	0	384
South Carolina	9	9	9	8,611	0	8,638
South Dakota	230	0	244	9,087	56	9,617
Tennessee	355	0	0	1,860	33	2,248
Texas	0	0	0	795	0	795
Utah	0	0	0	3,037	1,270	4,307
Vermont	4,745	0	0	115	0	4,860
Virginia	0	0	0	2,566	0	2,566
Washington	18,050	173,000	29,200	19,295	27,718	267,263
West Virginia	0	0	0	1,699	0	1,699
Wisconsin	0	0	0	1,080	1,323	2,403
Wyoming	665	0	250	4,259	512	5,686
American Samoa	2	0	0	0	0	2
CNMI	0	0	12	0	0	12
FSM	0	0	0	0	0	0
Guam	0	0	15	0	0	15
Marshall Islands	3,000	0	0	0	0	3,000
Palau	0	0	0	0	0	0
Puerto Rico	56	0	0	0	0	56
<b>Grand total</b>	<b>282,559</b>	<b>1,632,710</b>	<b>96,114</b>	<b>300,202</b>	<b>86,958</b>	<b>2,398,543</b>



**Table 7—Nursery production, in thousands of trees, by ownership category (in FY 98)**

	Forest Service	Bureau of Land Management	State	Local Govern- ment	Forest Industry	Other Industry	Total
Thousand Trees							
Alabama	0	0	41,500	0	86,000	0	127,500
Alaska	0	0	0	0	0	0	0
Arizona	0	0	0	0	0	50	50
Arkansas	0	0	15,000	0	110,000	0	125,000
California	8,719	0	2,230	0	0	0	10,949
Colorado	0	0	2,078	0	0	0	2,078
Connecticut	0	0	550	0	0	0	550
Delaware	0	0	0	0	0	0	0
Florida	0	0	24,821	0	64,000	66,000	154,821
Georgia	0	0	47,447	0	166,431	143,976	357,854
Hawaii	0	0	585	0	0	0	585
Idaho	15,870	0	517	0	3,206	7,462	27,055
Illinois	0	0	5,500	0	0	150	5,650
Indiana	0	0	4,500	0	0	1,500	6,000
Iowa	0	0	2,726	0	0	1,000	3,726
Kansas	0	0	186	636	0	0	822
Kentucky	0	0	6,500	2	300	5	6,807
Louisiana	0	0	40,282	0	0	26,000	66,282
Maine	0	0	0	0	1,250	2,000	3,250
Maryland	0	0	2,642	0	0	65	2,707
Massachusetts	0	0	0	0	0	0	0
Michigan	4,279	0	4,500	2,000	10,000	13,000	33,779
Minnesota	0	0	12,000	1,500	3,000	9,000	25,500
Mississippi	15,298	0	41,200	0	42,000	3,000	101,498
Missouri	0	0	4,545	1,000	0	2,000	7,545
Montana	0	0	726	0	1,630	0	2,356
Nebraska	1,274	0	0	0	0	0	1,274
Nevada	0	0	206	0	0	0	206
New Hampshire	0	0	220	0	0	0	220
New Jersey	0	0	417	0	0	0	417
New Mexico	0	0	157	23	0	89	269
New York	0	0	2,837	0	0	0	2,837
North Carolina	0	0	31,252	0	54,000	0	85,252
North Dakota	0	0	1,329	3,386	0	0	4,715
Ohio	0	0	4,770	0	0	0	4,770
Oklahoma	0	0	7,686	0	0	0	7,686
Oregon	16,471	834	25,043	0	24,700	0	67,048
Pennsylvania	0	0	4,700	0	0	16,000	20,770
Rhode Island	0	0	237	0	0	0	237
South Carolina	0	0	23,278	0	74,684	0	97,962
South Dakota	0	0	0	0	0	2,222	2,222
Tennessee	0	0	13,000	0	0	0	13,000
Texas	0	0	26,000	0	80,000	0	106,000
Utah	0	0	0	0	0	0	0
Vermont	0	0	0	0	0	0	0
Virginia	0	0	44,408	0	12,729	0	57,137
Washington	0	0	11,000	1,500	35,000	16,000	63,500
West Virginia	0	0	1,585	0	0	0	1,585
Wisconsin	0	0	20,625	0	3,700	4,600	28,925
Wyoming	0	0	0	0	0	0	0
American Samoa	0	0	14	0	0	1	15
CNMI	0	0	0	0	0	0	0
FSM	0	0	34	0	0	0	34
Guam	0	0	56	0	0	0	56
Marshall Islands	0	0	800	1,000	0	1,200	3,000
Palau	0	0	30	0	0	0	30
Puerto Rico	0	0	628	0	0	0	628
<b>Grand total</b>	<b>61,811</b>	<b>834</b>	<b>480,347</b>	<b>11,047</b>	<b>772,630</b>	<b>315,320</b>	<b>1,642,089</b>

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- List citations in the text by date, oldest first, then alphabetically by author (for example, Roberts 1982; Jones 1984, 1989; Smith and Jones 1990; Roberts 1991; Smith 1991; Smith and others 1999).
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Journal article: Smith AB, Jones CD. 1999. Seedling production at Georgia nurseries. *Tree Planters' Notes* 10(1): 11-21.

Entire book: Brown EF. 1988. *Trees of the eastern United States*. 2nd ed. Cambridge (MA): MIT Press. 1200 p.

Chapter in book: Jones CD. 1988. Hemlock. In: Brown EF, editor. *Trees of the eastern United States*. 2nd ed. Cambridge (MA): MIT Press. p 1123-1134.

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- Article in proceedings: Smith AB, Brown EF, Jones CD. 1999. Tree planting in Oregon. In: Roberts GH, Jones CD, editors. 22nd Annual Meeting of the Northern Tree Planters Association; 1998 Aug 11; Seattle, WA. Portland (OR): USDA Forest Service, Pacific Northwest Research Station. General Technical Report PNW-444. p 120-122.
- Thesis or dissertation: Roberts GH. 1977. Root form of planted trees [MSc thesis]. Berkeley (CA): University of California. 111 p.

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